Drinking Water Surveillance Program

HARROW-COLCHESTER WATER SUPPLY SYSTEM

Annual Report 1988

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HARROW-COLCHESTER WATER SUPPLY SYSTEM

DRINKING WATER SURVEILLANCE PROGRAM

ANNUAL REPORT 1988

FEBRUARY 1990

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EXECUTIVE SUMMARY

DRINKING WATER SURVEILLANCE PROGRAM

HARROW-COLCHESTER WATER SUPPLY SYSTEM
ANNUAL REPORT 1988

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to eventually include all municipal supplies in Ontario. Currently, 52 plants are being monitored.

The Harrow-Colchester Water Supply System uses a conventional treatment plant which treats water from Lake Erie. The process consists of coagulation, flocculation, clarification (upflow clarifier), filtration, disinfection and activated carbon adsorption. This plant has a design capacity of 10 x 1000 m^3/day and serves a population of approximately 3,300.

Raw and Treated water samples at the plant were taken in June and November and were analyzed for approximately 160 parameters. Parameters were divided into the following groups Bacteriological, Inorganic and Physical(Laboratory Chemistry, Field Chemistry and Metals) and Organics (Chloroaromatics, Chlorophenols, Pesticides and PCB, Phenolics, Polynuclear Aromatic Hydrocarbons, Specific Pesticides and Volatiles).

A summary of results is shown in Table 1.

Inorganic and Physical parameters (Laboratory Chemistry, Field Chemistry and Metals) were below any applicable health related ODWOs.

Of approximately 110 Organic parameters tested for on a monthly basis, none exceeded health related guidelines.

During 1988 the limited DWSP sampling results indicated that the Harrow-Colchester Water Treatment Plant produced good quality water.

TABLE 1

DRINKING WATER SURVEILLANCE PROGRAM HARROW-COLCHESTER SOUTH WSS

SUMMARY TABLE BY SCAN

SCAN	RAW TESTS	RAW POSITIVE	RAW %POSITIVE	TREATED TESTS	TREATED POSITIVE	TREATED %POSITIVE
BACTERIOLOGICAL	7	3	42	4	0	0
CHEMISTRY (FLD)	6	6	100	12	12	100
CHEMISTRY (LAB)	41	36	87	41	28	68
METALS	48	28	58	48	19	39
CHLOROAROMATICS	28	0	0	28	0	0
CHLOROPHENOLS	12	0	0	12	0	0
PAH	34	0	0	34	0	0
PESTICIDES & PCB	66	0	0	66	0	0
PHENOLICS	2	2	100	2	0	0
SPECIFIC PESTICIDES	56	0	0	56	0	0
VOLATILES	57	0	0	57	8	14
TOTAL	357	75		360	67	

NO HEALTH-RELATED GUIDELINES WERE EXCEEDED

A POSITIVE VALUE DENOTES THAT THE RESULT IS GREATER THAN THE STATISTICAL LIMIT OF DETECTION AND IS QUANTIFIABLE
A '.' INDICATES THAT NO SAMPLE WAS TAKEN

DRINKING WATER SURVEILLANCE PROGRAM

HARROW-COLCHESTER WATER TREATMENT PLANT
1988 ANNUAL REPORT

INTRODUCTION

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to eventually include all municipal supplies in Ontario. Currently, 52 plants are being monitored.

The DWSP was initiated at the Harrow-Colchester Water Treatment Plant in the spring of 1986. Annual reports were published for 1986 (ISBN 0-7729-2556-7) and 1987 (ISSN 0840-5239).

This report contains information and results for 1988.

PLANT DESCRIPTION

The Harrow-Colchester Water Treatment Plant is a conventional treatment plant which treats water from Lake Erie. The process consists of coagulation, flocculation, clarification (upflow clarifier), filtration, powdered activated carbon adsorption (for taste and odour control) and disinfection. The Harrow-Colchester plant has a design capacity of 10 x 1000 m^3/day and sample day flows of 1.5 x 1000 m^3/day and 1.6 x 1000 m^3/day and serves a

population of approximately 3,300.

The plant location is shown in Figure 1. Plant process details, in a block schematic, are shown in Figure 2. General plant information is presented in Table 2.

METHODS

Water samples were obtained from two DWSP approved locations;

i) Raw - The water originated from the lowlift chamber and was sampled through a copper sample line. The sample tap is located in the plant laboratory.

ii) Treated - The water originated from the highlift discharge after addition of all treatment chemicals and was sampled through a copper sample line. The sample tap is located in the plant laboratory.

Sample lines in the plant were flushed prior to sampling to ensure that the water obtained was indicative of its origin and not residual water standing in the sample line.

Attempts were made to capture the same block of water at each sampling point by taking the retention time into consideration. The retention time was calculated by dividing the volume of water between the two sampling points by the sample day flow. For example, if it was determined that the retention time within the

FIGURE 1

DRINKING WATER SURVEILLANCE PROGRAM

SITE LOCATION MAP

HARROW-COLCHESTER WATER SUPPLY SYSTEM

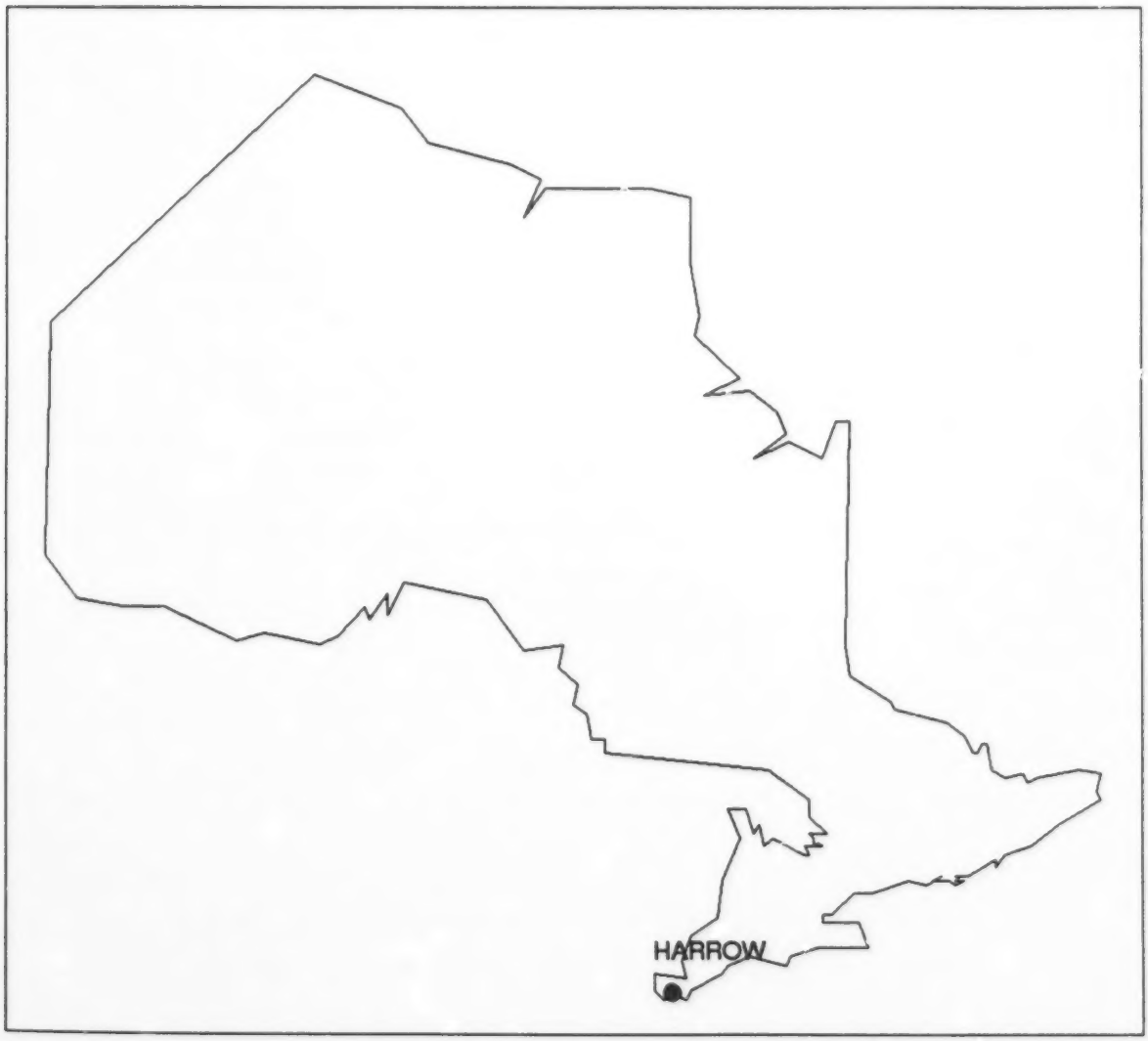

FIGURE 2

HARROW-COLCHESTER WATER TREATMENT PLANT

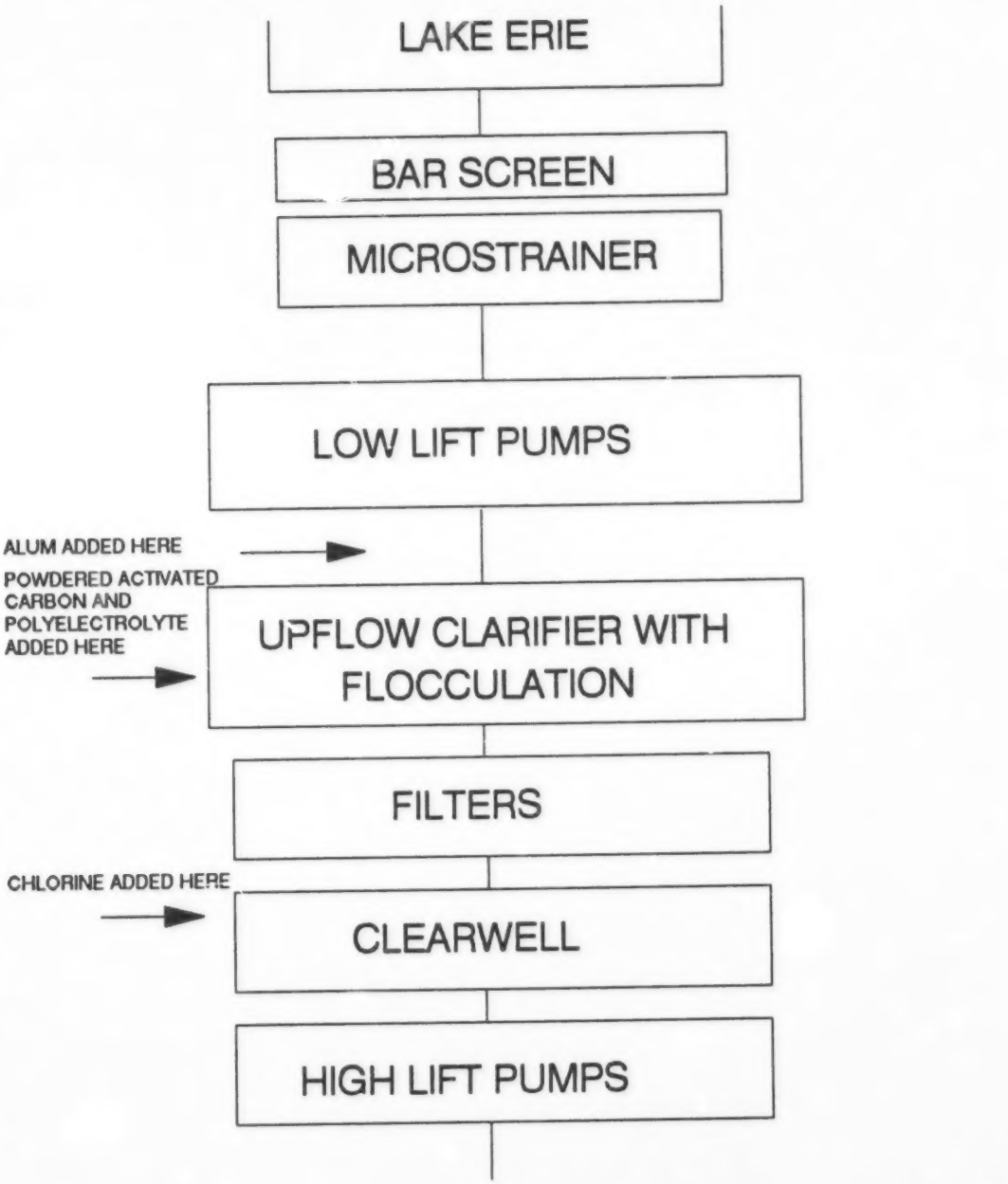

TABLE 2

DRINKING WATER SURVEILLANCE PROGRAM ANNUAL REPORT

GENERAL INFORMATION

HARROW-COLCHESTER WATER TREATMENT PLANT

LOCATION:	P. O. BOX 909 HARROW, ONTARIO N6R 1G0 (519-738-3038)
SOURCE:	RAW WATER SOURCE - LAKE ERIE
DESIGN CAPACITY:	10 (1000 M^3/DAY)
OPERATION:	MINISTRY OF ENVIRONMENT
PLANT SUPERINTENDENT:	G. E. JOHNSTON
MINISTRY REGION:	SOUTHWESTERN
DISTRICT OFFICER:	J. DRUMMOND

MUNICIPALITY SERVED	POPULATION
TOWN OF HARROW	2,281
COLCHESTER TOWNSHIP	1,047

plant was five hours then there would be a five hour interval between the raw and treated sampling.

Stringent DWSP sampling protocols were followed to that all samples were taken in a uniform manner.

Sample day flow, treatment chemical dosages and field measurements such as Turbidity, Chlorine Residuals, pH and Temperature were recorded on the day of sampling and were entered onto the DWSP data base as submitted.

RESULTS

Raw and Treated water from the Harrow-Colchester Water Treatment Plant was sampled for approximately 160 parameters in June and November 1988.

Table 3 contains information on the sample day retention time, flow rate and treatment chemicals used and their associated dosages.

Table 4 is a summary break-down of the number of water samples analysed by parameter and by water type. The number of times that a positive or trace result was detected is also reported.

Positive denotes that the result is greater than the statistical limit of detection established by the Ministry of the Environment

(MOE) laboratory staff and is quantifiable. Trace (<T) denotes that the level measured is greater than the lowest value detectable by the method but lies so close to the detection limit that it cannot be confidently quantified.

Table 5 presents the results for parameters detected on at least one occasion.

Table 6 lists all parameters analysed on DWSP.

Associated guidelines and detection limits are also supplied on tables 5 and 6. Parameters are listed alphabetically within each scan.

DISCUSSION

General

Water quality is judged by comparison with the Ontario Drinking Water Objectives (ODWOs) as defined in the 1984 publication (ISBN 0-7743-8985-0). The Province of Ontario has health related and aesthetic objectives for 49 parameters, these are currently under review. When an ODWO is not available guidelines/limits from other agencies are consulted. The Parameters Listing System (PALIS) recently published (ISBN 0-7729-4461-X) by the MOE catalogues and keeps current over 1750 guidelines for 650 parameters from agencies throughout the world.

Although some of the parameters measured on DWSP may be present in the raw and treated water as a result of pollution, many of the compounds detected are naturally occuring or are treatment by-products.

The DWSP does not analyse for Taste and Odour or other biological water quality parameters, and can therefore not assess these aspects of the water supply.

As stated under Results, traces do not indicate quantifiable results as defined by established MOE laboratory analytical reporting protocols. While they can be useful in trend analysis or confirmation of the presence of a specific contaminant that is repeatedly detected at these levels, the occasional finding of a trace level of a contaminant is not considered to be significant. **DISCUSSION OF GUIDELINES AND LIMITS THEREFORE, IS ONLY CONDUCTED ON POSITIVE RESULTS.**

Bacteriology

Results for the Bacteriology scan show that no parameters were detected in treated waters.

Guidelines for bacteriological sampling and testing of a supply are developed to maintain a proper supervision of its

bacteriological quality; the routine monitoring program usually requires the taking of multiple samples in a given system. Full interpretation of bacteriological quality cannot be made on the basis of single samples. Routine bacteriological monitoring, as outlined in the ODWOs is carried out by the operating authority.

Inorganic and Physical

Laboratory and Field Chemistry

The results for the Laboratory Chemistry and Field Chemistry scans were below any applicable health related ODWOs.

It is desirable that the Temperature of drinking water be less than 15°C; the palatability of water is enhanced by its coolness. A temperature below 15°C will tend to reduce the growth of nuisance organisms and hence minimize associated taste, colour, odour and corrosion problems. The temperature of the treated water may increase as a result of higher temperatures in the source water. The desired ODWO was exceeded in the June treated water.

The Langelier Index is used extensively in estimating the corrosion potential of water. An increasingly negative index indicates the increasing possibility of corrosion. It is considered sound engineering practice to maintain a slightly positive Langelier Index. The Langelier Index for the Harrow-Colchester water is positive for both June and November.

Metals

The results reported for the Metals scan were below any applicable health related ODWOs.

Many metals were lower in the treated water as compared to the raw water. This is a result of the treatment process. The addition of Alum as a coagulant to the raw water and the resulting coagulation/settling process has been shown to reduce the levels of most metals.

Organic Parameters

Chloroaromatics

The results of the Chloroaromatics scan showed that no chloroaromatics were detected.

Chlorophenols

The results of the Chlorophenols scan showed that no chlorophenols were detected.

Pesticides and PCB (Polychlorinated Biphenyl)

The results of the Pesticides and PCB scan showed that no PCBs were detected and that one pesticide was detected:

Alpha BHC

There are several isomers of BHC (Benzene Hexachloride); gamma BHC is the active ingredient of the pesticide Lindane, while alpha BHC is the isomer predominantly found in surface waters from the Great Lakes Basin as indicated in results from other water supplies on DWSP.

Alpha BHC was detected at a trace level in one raw water sample.

Specific Pesticides

Results of the Specific Pesticides scan showed that no Specific Pesticides were detected.

Phenolics

The maximum desirable concentration of phenolic substances in drinking water is 2.0 ug/L. This limit has been set primarily to prevent the occurrence of undesirable tastes and odours, particularly in chlorinated water. Phenolics were detected at 1.2 ug/L in both raw water samples. Phenolics were detected at trace levels in both treated water samples. Phenolic compounds are present in the aquatic environment as a result of natural and/or industrial processes.

Polynuclear Aromatic Hydrocarbons (PAHs)

The results of the PAH scan showed that no PAHs were detected.

Volatiles

The results of the Volatiles scan showed that only Trihalomethanes(THMs), were detected. THMs are acknowledged to be produced during the water treatment process and will always occur in chlorinated surface waters. THMs are comprised mainly of Chloroform, Chlorodibromomethane and Dichlorobromomethane. Bromoform occurrs occasionally. Results are reported for the individual compounds as well as for total THMs.

Chloroform, Chlorodibromomethane, Dichlorobromomethane, Bromoform and Total THMs were detected in the two treated water samples. Total THM occurrences, in both June and November at 22.1 ug/L and 22.8 ug/L respectively, were well below the ODWO of 350 ug/L.

CONCLUSIONS

The Harrow Colchester Water Treatment plant for the sample year of 1988 produced good quality water based on the limited DWSP sampling.

No health related guidelines, for organic or inorganic parameters, were exceeded during 1986, 1987 or 1988.

TABLE 3

DRINKING WATER SURVEILLANCE PROGRAM HARROW-COLCHESTER SOUTH WSS SAMPLE DAY CONDITIONS F 1988

	SAMPLE DAY CONDITIONS		TREATMENT CHEMICAL DOSAGES (MG/L)			
			COAGULATION	COAGULATION AID	ADSORPTION	POST-CHLORINATION
			ALUM LIQUID	POLYELECTROLYTE	ACTIVATED CARBON POWDER	CHLORINE
DATE	RETENTION TIME(HRS)	FLOW (1000M3)				
JUN 27	8.0	1.6	20.00	.14	5.00	.85
NOV 23	51.5	1.5	20.00	.10	5.00	.

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM HARROW-COLCHESTER

SUMMARY TABLE OF RESULTS (1988)

		RAW			TREATED		
SCAN	PARAMETER	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
BACTERIOLOGICAL	FECAL COLIFORM MF	2	0	0	.	.	.
	STANDRD PLATE CNT MF	1	1	0	1	0	0
	P/A BOTTLE	.	.	.	1	0	0
	TOTAL COLIFORM MF	2	1	0	1	0	0
	T COLIFORM BCKGRD MF	2	1	0	1	0	0
*TOTAL SCAN BACTERIOLOGICAL		7	3	0	4	0	0
*TOTAL GROUP BACTERIOLOGICAL		7	3	0	4	0	0
CHEMISTRY (FLD)	FLD CHLORINE (COMB)	.	.	.	2	2	0
	FLD CHLORINE FREE	.	.	.	2	2	0
	FLD CHLORINE (TOTAL)	.	.	.	2	2	0
	FLD PH	2	2	0	2	2	0
	FLD TEMPERATURE	2	2	0	2	2	0
	FLD TURBIDITY	2	2	0	2	2	0
*TOTAL SCAN CHEMISTRY (FLD)		6	6	0	12	12	0
CHEMISTRY (LAB)	ALKALINITY	2	2	0	2	2	0
	CALCIUM	2	2	0	2	2	0
	CYANIDE	2	0	0	2	0	0
	CHLORIDE	2	2	0	2	2	0
	COLOUR	2	0	2	2	0	1

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM HARROW-COLCHESTER

SUMMARY TABLE OF RESULTS (1988)

SCAN	PARAMETER	RAW			TREATED		
		TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
CHEMISTRY (LAB)	CONDUCTIVITY	2	2	0	2	2	0
	FLUORIDE	2	2	0	2	2	0
	HARDNESS	2	2	0	2	2	0
	IONCAL	2	1	0	2	1	0
	LANGELIERS INDEX	2	2	0	2	2	0
	MAGNESIUM	2	2	0	2	2	0
	SODIUM	2	2	0	2	2	0
	AMMONIUM TOTAL	2	2	0	2	1	1
	NITRITE	2	2	0	2	0	0
	TOTAL NITRATES	2	2	0	2	2	0
	NITROGEN TOT KJELD	2	2	0	2	1	1
	PH	2	2	0	2	2	0
	PHOSPHORUS FIL REACT	2	2	0	2	0	2
	PHOSPHORUS TOTAL	2	2	0	2	0	2
	SULPHATE	1	1	0	1	1	0
	TURBIDITY	2	2	0	2	2	0
*TOTAL SCAN CHEMISTRY (LAB)		41	36	2	41	28	7
METALS	SILVER	2	0	1	2	1	0
	ALUMINUM	2	2	0	2	2	0
	ARSENIC	2	0	2	2	0	2
	BARIUM	2	2	0	2	2	0
	BORON	2	1	1	2	1	1

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM HARROW-COLCHESTER

SUMMARY TABLE OF RESULTS (1988)

SCAN	PARAMETER	RAW			TREATED		
		TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
METALS	BERYLLIUM	2	0	2	2	0	1
	CADMIUM	2	0	1	2	0	1
	COBALT	2	0	2	2	0	1
	CHROMIUM	2	1	1	2	1	0
	COPPER	2	2	0	2	0	2
	IRON	2	2	0	2	0	1
	MERCURY	2	0	0	2	0	0
	MANGANESE	2	2	0	2	2	0
	MOLYBDENUM	2	2	0	2	2	0
	NICKEL	2	0	2	2	0	2
	LEAD	2	2	0	2	0	2
	ANTIMONY	2	1	1	2	1	1
	SELENIUM	2	0	2	2	0	2
	STRONTIUM	2	2	0	2	2	0
	TITANIUM	2	2	0	2	1	1
	THALLIUM	2	1	0	2	0	1
	URANIUM	2	2	0	2	0	2
	VANADIUM	2	2	0	2	2	0
	ZINC	2	2	0	2	2	0
*TOTAL SCAN METALS		48	28	15	48	19	20
*TOTAL GROUP INORGANIC & PHYSICAL		95	70	17	101	59	27
CHLOROAROMATICS	HEXACHLOROBUTADIENE	2	0	0	2	0	0

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM HARROW-COLCHESTER

SUMMARY TABLE OF RESULTS (1988)

SCAN	PARAMETER	RAW			TREATED		
		TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
CHLOROAROMATICS	123 TRICHLOROBENZENE	2	0	0	2	0	0
	1234 T-CHLOROBENZENE	2	0	0	2	0	0
	1235 T-CHLOROBENZENE	2	0	0	2	0	0
	124 TRICHLOROBENZENE	2	0	0	2	0	0
	1245 T-CHLOROBENZENE	2	0	0	2	0	0
	135 TRICHLOROBENZENE	2	0	0	2	0	0
	HCB	2	0	0	2	0	0
	HEXACHLOROETHANE	2	0	0	2	0	0
	OCTACHLOROSTYRENE	2	0	0	2	0	0
	PENTACHLOROBENZENE	2	0	0	2	0	0
	236 TRICHLOROTOLUENE	2	0	0	2	0	0
	245 TRICHLOROTOLUENE	2	0	0	2	0	0
	26A TRICHLOROTOLUENE	2	0	0	2	0	0
*TOTAL SCAN CHLOROAROMATICS		28	0	0	28	0	0
CHLOROPHENOLS	234 TRICHLOROPHENOL	2	0	0	2	0	0
	2345 T-CHLOROPHENOL	2	0	0	2	0	0
	2356 T-CHLOROPHENOL	2	0	0	2	0	0
	245-TRICHLOROPHENOL	2	0	0	2	0	0
	246-TRICHLOROPHENOL	2	0	0	2	0	0
	PENTACHLOROPHENOL	2	0	0	2	0	0
*TOTAL SCAN CHLOROPHENOLS		12	0	0	12	0	0

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM HARROW-COLCHESTER

SUMMARY TABLE OF RESULTS (1988)

SCAN	PARAMETER	RAW			TREATED		
		TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
PAH	PHENANTHRENE	2	0	0	2	0	0
	ANTHRACENE	2	0	0	2	0	0
	FLUORANTHENE	2	0	0	2	0	0
	PYRENE	2	0	0	2	0	0
	BENZO(A)ANTHRACENE	2	0	0	2	0	0
	CHRYSENE	2	0	0	2	0	0
	DIMETH. BENZ(A)ANTHR	2	0	0	2	0	0
	BENZO(E) PYRENE	2	0	0	2	0	0
	BENZO(J) FLUORANTHEN	0	0	0	0	0	0
	BENZO(B) FLUORANTHEN	2	0	0	2	0	0
	PERYLENE	2	0	0	2	0	0
	BENZO(K) FLUORANTHEN	2	0	0	2	0	0
	BENZO(A) PYRENE	2	0	0	2	0	0
	BENZO(G,H,I) PERYLEN	2	0	0	2	0	0
	DIBENZO(A,H) ANTHRAC	2	0	0	2	0	0
	INDENO(1,2,3-C,D) PY	2	0	0	2	0	0
	BENZO(B) CHRYSENE	2	0	0	2	0	0
	ANTHANTHRENE	0	0	0	0	0	0
	CORONENE	2	0	0	2	0	0
*TOTAL SCAN PAH		34	0	0	34	0	0
PESTICIDES & PCB	ALDRIN	2	0	0	2	0	0
	ALPHA BHC	2	0	1	2	0	0

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM HARROW-COLCHESTER

SUMMARY TABLE OF RESULTS (1988)

SCAN	PARAMETER	RAW			TREATED		
		TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
PESTICIDES & PCB	BETA BHC	2	0	0	2	0	0
	LINDANE	2	0	0	2	0	0
	ALPHA CHLORDANE	2	0	0	2	0	0
	GAMMA CHLORDANE	2	0	0	2	0	0
	DIELDRIN	2	0	0	2	0	0
	METHOXYCHLOR	2	0	0	2	0	0
	ENDOSULFAN I	2	0	0	2	0	0
	ENDOSULFAN II	2	0	0	2	0	0
	ENDRIN	2	0	0	2	0	0
	ENDOSULFAN SULPHATE	2	0	0	2	0	0
	HEPTACHLOR EPOXIDE	2	0	0	2	0	0
	HEPTACHLOR	2	0	0	2	0	0
	MIREX	2	0	0	2	0	0
	OXYCHLORDANE	2	0	0	2	0	0
	OPDDT	2	0	0	2	0	0
	PCB	2	0	0	2	0	0
	DDD	2	0	0	2	0	0
	PPDDE	2	0	0	2	0	0
	PPDDT	2	0	0	2	0	0
	AMETRINE	2	0	0	2	0	0
	ATRAZINE	2	0	0	2	0	0
	ATRATONE	2	0	0	2	0	0
	CYANAZINE	2	0	0	2	0	0
	DES ETHYL ATRAZINE	1	0	0	1	0	0
	DES ETHYL SIMAZINE	1	0	0	1	0	0

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM HARROW-COLCHESTER

SUMMARY TABLE OF RESULTS (1988)

SCAN	PARAMETER	RAW TOTAL	RAW POSITIVE	RAW TRACE	TREATED TOTAL	TREATED POSITIVE	TREATED TRACE
PESTICIDES & PCB	PROMETONE	2	0	0	2	0	0
	PROPAZINE	2	0	0	2	0	0
	PROMETRYNE	2	0	0	2	0	0
	METRIBUZIN	2	0	0	2	0	0
	SIMAZINE	2	0	0	2	0	0
	ALACHLOR	2	0	0	2	0	0
	METOLACHLOR	2	0	0	2	0	0
*TOTAL SCAN PESTICIDES & PCB		66	0	1	66	0	0
PHENOLICS	PHENOLICS	2	2	0	2	0	2
*TOTAL SCAN PHENOLICS		2	2	0	2	0	2
SPECIFIC PESTICIDES	TOXAPHENE	0	0	0	0	0	0
	2,4,5-T	2	0	0	2	0	0
	2,4-D	2	0	0	2	0	0
	24DCHLRPHENOXYBUTYRC	2	0	0	2	0	0
	2,4 D PROPIONIC ACID	2	0	0	2	0	0
	DICAMBA	2	0	0	2	0	0
	PICHLORAM	0	0	0	0	0	0
	SILVEX	2	0	0	2	0	0
	DIAZINON	2	0	0	2	0	0

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM HARROW-COLCHESTER

SUMMARY TABLE OF RESULTS (1988)

SCAN	PARAMETER	RAW			TREATED		
		TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
SPECIFIC PESTICIDES	DICHLOROVOS	2	0	0	2	0	0
	CHLORPYRIFOS	2	0	0	2	0	0
	ETHION	2	0	0	2	0	0
	AZINPHOS-METHYL	0	0	0	0	0	0
	MALATHION	2	0	0	2	0	0
	MEVINPHOS	2	0	0	2	0	0
	METHYL PARATHION	2	0	0	2	0	0
	METHYLTRITHION	2	0	0	2	0	0
	PARATHION	2	0	0	2	0	0
	PHORATE	2	0	0	2	0	0
	BELDAN	2	0	0	2	0	0
	RONNEL	2	0	0	2	0	0
	AMINOCARB	0	0	0	0	0	0
	BENOMYL	2	0	0	2	0	0
	BUX	2	0	0	2	0	0
	CARBOFURAN	2	0	0	2	0	0
	CICP	2	0	0	2	0	0
	DIALLATE	2	0	0	2	0	0
	EPTAM	2	0	0	2	0	0
	IPC	2	0	0	2	0	0
	PROPOXUR	2	0	0	2	0	0
	CARBARYL	2	0	0	2	0	0
	BUTYLATE	2	0	0	2	0	0
*TOTAL SCAN SPECIFIC PESTICIDES		56	0	0	56	0	0

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM HARROW-COLCHESTER

SUMMARY TABLE OF RESULTS (1988)

SCAN	PARAMETER	RAW			TREATED		
		TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
VOLATILES	BENZENE	2	0	0	2	0	0
	TOLUENE	2	0	0	2	0	0
	ETHYLBENZENE	2	0	0	2	0	0
	P-XYLENE	2	0	0	2	0	0
	M-XYLENE	2	0	0	2	0	0
	O-XYLENE	2	0	0	2	0	0
	STYRENE	1	0	0	1	0	0
	1,1 DICHLOROETHYLENE	2	0	0	2	0	0
	METHYLENE CHLORIDE	2	0	0	2	0	0
	T1,2DICHLOROETHYLENE	2	0	0	2	0	0
	1,1 DICHLOROETHANE	2	0	0	2	0	0
	CHLOROFORM	2	0	0	2	2	0
	111, TRICHLOROETHANE	2	0	0	2	0	0
	1,2 DICHLOROETHANE	2	0	0	2	0	0
	CARBON TETRACHLORIDE	2	0	0	2	0	0
	1,2 DICHLOROPROPANE	2	0	0	2	0	0
	TRICHLOROETHYLENE	2	0	0	2	0	0
	DICHLOROBROMOMETHANE	2	0	0	2	2	0
	112 TRICHLOROETHANE	2	0	0	2	0	0
	CHLORODIBROMOMETHANE	2	0	0	2	2	0
	T-CHLOROETHYLENE	2	0	0	2	0	0
	BROMOFORM	2	0	0	2	0	2
	1122 T-CHLOROETHANE	2	0	0	2	0	0
	CHLOROBENZENE	2	0	0	2	0	0
	1,4 DICHLOROBENZENE	2	0	0	2	0	0

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM HARROW-COLCHESTER

SUMMARY TABLE OF RESULTS (1988)

SCAN	PARAMETER	RAW			TREATED		
		TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
VOLATILES	1,3 DICHLOROBENZENE	2	0	0	2	0	0
	1,2 DICHLOROBENZENE	2	0	0	2	0	0
	ETHLYENE DIBROMIDE	2	0	0	2	0	0
	TOTL TRIHALOMETHANES	2	0	0	2	2	0
*TOTAL SCAN VOLATILES		57	0	0	57	8	2
*TOTAL GROUP ORGANIC		255	2	1	255	8	4
TOTAL		357	75	18	360	67	31

KEY TO TABLE 5 and 6

A ONTARIO DRINKING WATER OBJECTIVES (ODWO)

1. Maximum Acceptable Concentration (MAC)

1+. MAC for Total Trihalomethanes

1*. MAC for Bacteriological Analyses
Poor water quality is indicated when :
- total coliform counts > 0 < 5
- P/A Bottle Test is present after 48 hours
- Aeromonas organisms are detected in more than 25% of samples in a single submission or in successive submissions from the same sampling site
- Pseudomonas Aeruginosa, Staphylococcus Aureus and members of the Fecal Streptococcus group should not be detected in any sample
- Standard Plate Count should not exceed 500 organisms per ml at 35 ^{0}C within 48 hours

2. Interim Maximum Acceptable Concentration (IMAC)

3. Maximum Desirable Concentration (MDC)

4. Aesthetic or Recommended Operational Guideline
- hardness levels between 80 and 100 mg/L as calcium carbonate are considered to provide an acceptable balance between corrosion and incrustation, water supplies with a hardness >200 mg/L are considered poor and those in excess of 500 mg/L are unacceptable.

B HEALTH & WELFARE CANADA (H&W)

1. Maximum Acceptable Concentration (MAC)
2. Proposed MAC
3. Interim MAC
4. Aesthetic Objective (AO) (for xylenes, the AO is a total)

C WORLD HEALTH ORGANIZATION (WHO)

1. Guideline Value (GV)
2. Tentative GV
3. Aesthetic GV

D US ENVIRONMENTAL PROTECTION AGENCY (EPA)

1. Maximum Contaminant Level (MCL)
2. Suggested No-Adverse Effect Level (SNAEL)
3. Lifetime Health Advisory
4. EPA Ambient Water Quality Criteria

F EUROPEAN ECONOMIC COMMUNITY (EEC)

1. Health Related Guideline Level
2. Aesthetic Guideline Level
3. Maximum Admissable Concentration (MADC)

G CALIFORNIA STATE DEPARTMENT OF HEALTH-GUIDELINE VALUE

H USSR MAXIMUM PERMISSIBLE CONCENTRATION

I NEW YORK STATE AMBIENT WATER GUIDELINE

N/A NONE AVAILABLE

INTERPRETATION OF DATA

The interpretation of analytical results that are obtained from measurements near the limit of detection of the measurement process is subject to greater uncertainty than those at higher concentrations. The principle areas of concern relate to whether the substance has actually been detected, whether it has been properly identified, and whether it is an artifact of the measurement process. In other words, false positives can be caused by the instrumentation or the test procedures used, when in fact these compounds are not present in the sample.

There are several methods to treat data from such measurements:
1. Exclude the low-level data because of this uncertainty factor. However, studies of long-term environmental trends and modelling may be adversely affected by exclusion of such data.
2. Qualify these data so the user is aware of the greater uncertainty associated with their use.

For the Drinking Water Surveillance Program, measurements near the limit of detection of the measurement process are reported qualified by the code "<T". Results quantified by "W" indicate a zero measurement. These results are reported for purposes of modelling and long-term trend analysis and no significance should be attributed to a single determination of a substance below "T" (a single determination may well be a false positive). Repeat analysis or additional data are needed before it can be stated with certainty that the substance in question was truly present. On the other hand, it is less likely that repeated detection of a substance at or near the limit of detection at a specific location is solely due to an artifact in the measurement system, and more likely represents a true positive. However the average of such data is still only an estimate of the amount of substance present subject to the possible biases of the method used.

LABORATORY RESULTS, REMARK DESCRIPTIONS

.	No Sample Taken
BDL	Below Minimum Measurable Amount
<T	Greater Than Detection Limit But Not Confident (SEE INTERPRETATION OF RESULTS ABOVE)
>	Results Are Greater Than The Upper Limit
<=>	Approximate Result
!AW	No Data: Analysis Withdrawn
!CR	No Data: Could Not Confirm By Reanalysis
!CS	No Data: Contamination Suspected
!IL	No Data: Sample Incorrectly Labelled
!IS	No Data: Insufficient Sample
!LA	No Data: Laboratory Accident

!LD	No Data: Test Queued After Sample Discarded
!NA	No Data: No Authorization To Perform Reanalysis
!NP	No Data: No Procedure
!NR	No Data: Sample Not Received
!OP	No Data: Obscured Plate
!QU	No Data: Quality Control Unacceptable
!PE	No Data: Procedural Error - Sample Discarded
!PH	No Data: Sample pH Outside Valid Range
!RE	No Data: Received Empty
!RO	No Data: See Attached Report (no numeric results)
!SM	No Data: Sample Missing
!SS	No Data: Send Separate Sample Properly Preserved
!UI	No Data: Indeterminant Interference
!TX	No Data: Time Expired
A3C	Approximate, Total Count Exceeded 300 Colonies
APL	Additional Peak, Large, Not Priority Pollutant
APS	Additional Peak, Less Than, Not Priority Pollutant
CIC	Possible Contamination, Improper Cap
CRO	Calculated Result Only
PPS	Test Performed On Preserved Sample
RMP	P and M-Xylene Not Separated
RRV	Rerun Verification
RVU	Reported Value Unusual
SPS	Several Peaks, Small, Not Priority Pollutant
UAL	Unreliable: Sample Age Exceeds Normal Limit
UCR	Unreliable: Could Not Confirm By Reanalysis
UCS	Unreliable: Contamination Suspected
UIN	Unreliable: Indeterminant Interference
XP	Positive After X Number of Hours
T# (T06)	Result Taken After # Hours

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM HARROW-COLCHESTER SOUTH WSS 1988

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM
	RAW	TREATED	
BACTERIOLOGICAL			
FECAL COLIFORM MF (CT/100ML)		DET'N LIMIT = 0	GUIDELINE = 0 (A1)
JUN	0	.	
NOV	0	.	
STANDRD PLATE CNT MF (CT/ML)		DET'N LIMIT = 0	GUIDELINE = 500/ML (A1)
JUN	2400 >	0	
P/A BOTTLE ( )		DET'N LIMIT = 0	GUIDELINE = 0 (A1*)
JUN	.	0	
TOTAL COLIFORM MF (CT/100ML)		DET'N LIMIT = 0	GUIDELINE = 5/100ML(A1)
JUN	42 A3C	0	
NOV	0	.	
T COLIFORM BCKGRD MF (CT/100ML)		DET'N LIMIT = 0	GUIDELINE = N/A
JUN	4800 >	0	
NOV	0	.	

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM HARROW-COLCHESTER SOUTH WSS 1988

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM	
	RAW	TREATED		
CHEMISTRY (FLD)				
FLD CHLORINE (COMB) ( )			DET'N LIMIT = N/A	GUIDELINE = N/A
JUN	.	.100		
NOV	.	.100		
FLD CHLORINE FREE ( )			DET'N LIMIT = N/A	GUIDELINE = N/A
JUN	.	.660		
NOV	.	.530		
FLD CHLORINE (TOTAL) ( )			DET'N LIMIT = N/A	GUIDELINE = N/A
JUN	.	.760		
NOV	.	.630		
FLD PH (DIMNSLESS)			DET'N LIMIT = N/A	GUIDELINE = 6.5-8.5(A4)
JUN	8.300	7.410		
NOV	8.000	7.310		
FLD TEMPERATURE (DEG.C)			DET'N LIMIT = N/A	GUIDELINE = 15 (A1)
JUN	21.800	22.200		
NOV	8.300	9.600		
FLD TURBIDITY (FTU)			DET'N LIMIT = N/A	GUIDELINE = 1.0 (A1)
JUN	7.800	.140		
NOV	18.000	.130		

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM HARROW-COLCHESTER SOUTH WSS 1988

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM
	RAW	TREATED	
CHEMISTRY (LAB)			
ALKALINITY (MG/L)		DET'N LIMIT = .200	GUIDELINE = 30-500 (A4)
JUN	95.100	84.300	
NOV	86.200	78.800	
CALCIUM (MG/L)		DET'N LIMIT = .100	GUIDELINE = 100 (F2)
JUN	34.600	32.200	
NOV	33.000	33.800	
CHLORIDE (MG/L)		DET'N LIMIT = .200	GUIDELINE = 250 (A3)
JUN	9.100	10.200	
NOV	18.300	20.600	
COLOUR (HZU)		DET'N LIMIT = .5	GUIDELINE = 5.0 (A3)
JUN	2.000 <T	BDL	
NOV	2.000 <T	.500 <T	
CONDUCTIVITY (UMHO/CM)		DET'N LIMIT = 1	GUIDELINE = 400 (F2)
JUN	250	257	
NOV	267	282	
FLUORIDE (MG/L)		DET'N LIMIT = .01	GUIDELINE = 2.400 (A1)
JUN	.090	.090	
NOV	.100	.080	
HARDNESS (MG/L)		DET'N LIMIT = .500	GUIDELINE = 80-100 (A4)
JUN	121.000	113.000	
NOV	114.000	116.000	
IONCAL (DMNSLESS)		DET'N LIMIT = N/A	GUIDELINE = N/A
JUN	.000 NAF	.000 NAF	
NOV	.331	1.437	
LANGELIERS INDEX (DMNSLESS)		DET'N LIMIT = N/A	GUIDELINE = N/A
JUN	.358 NAF	.131 NAF	
NOV	.178	.013	

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM HARROW-COLCHESTER SOUTH WSS 1988

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM
	RAW	TREATED		
MAGNESIUM (MG/L)			DET'N LIMIT = .050	GUIDELINE = 30 (F2)
JUN	8.500	8.100		
NOV	7.700	7.800		
SODIUM (MG/L)			DET'N LIMIT = .200	GUIDELINE = 200 (C3)
JUN	6.400	5.200		
NOV	8.800	9.200		
AMMONIUM TOTAL (MG/L)			DET'N LIMIT = 0.002	GUIDELINE = .05 (F2)
JUN	.036	.008 <T		
NOV	.026	.010		
NITRITE (MG/L)			DET'N LIMIT = 0.001	GUIDELINE = 1.000 (A1)
JUN	.018	BDL		
NOV	.005	BDL		
TOTAL NITRATES (MG/L)			DET'N LIMIT = .020	GUIDELINE = 10.000 (A1)
JUN	.250	.265		
NOV	.535	.580		
NITROGEN TOT KJELD (MG/L)			DET'N LIMIT = .020	GUIDELINE = N/A
JUN	.260	.100		
NOV	.220	.070 <T		
PH (DIMNSLESS)			DET'N LIMIT = N/A	GUIDELINE = 6.5-8.5(A4)
JUN	8.260	8.120		
NOV	8.150	8.020		
PHOSPHORUS FIL REACT (MG/L)			DET'N LIMIT = .0005	GUIDELINE = N/A
JUN	.007	.001 <T		
NOV	.002	.000 <T		
PHOSPHORUS TOTAL (MG/L)			DET'N LIMIT = .002	GUIDELINE = .40 (F2)
JUN	.022	.002 <T		
NOV	.023	.002 <T		
SULPHATE ( )			DET'N LIMIT = .200	GUIDELINE = 500. (A3)

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM HARROW-COLCHESTER SOUTH WSS 1988

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM
	RAW	TREATED	
NOV	18.150	27.400	
TURBIDITY (FTU)		DET'N LIMIT = .02	GUIDELINE = 1.00 (A1)
JUN	11.700	.120	
NOV	24.000	.480	

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM HARROW-COLCHESTER SOUTH WSS 1988

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM
	RAW	TREATED	
METALS			
SILVER (UG/L)		DET'N LIMIT = .020	GUIDELINE = 50. (A1)
JUN	BDL	BDL	
NOV	.030 <T	.550	
ALUMINUM (UG/L)		DET'N LIMIT = .050	GUIDELINE = 100.(A4)
JUN	174.000	91.640	
NOV	150.800	38.280	
ARSENIC (UG/L)		DET'N LIMIT = 0.050	GUIDELINE = 50.0 (A1)
JUN	1.000 <T	.670 <T	
NOV	.840 <T	.270 <T	
BARIUM (UG/L)		DET'N LIMIT = 0.020	GUIDELINE = 1000. (A1)
JUN	19.000	20.000	
NOV	18.000	17.000	
BORON (UG/L)		DET'N LIMIT = 0.200	GUIDELINE = 5000. (A1)
JUN	15.000 <T	16.000 <T	
NOV	29.000	32.000	
BERYLLIUM (UG/L)		DET'N LIMIT = 0.010	GUIDELINE = .20 (H)
JUN	.050 <T	BDL	
NOV	.190 <T	.060 <T	
CADMIUM (UG/L)		DET'N LIMIT = 0.050	GUIDELINE = 5.000 (A1)
JUN	BDL	BDL	
NOV	.110 <T	.060 <T	
COBALT (UG/L)		DET'N LIMIT = 0.020	GUIDELINE = 1000 (H)
JUN	.120 <T	BDL	
NOV	.390 <T	.110 <T	
CHROMIUM (UG/L)		DET'N LIMIT = 0.100	GUIDELINE = 50. (A1)
JUN	.300 <T	BDL	
NOV	3.200	2.700	

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM HARROW-COLCHESTER SOUTH WSS 1988

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM
	RAW	TREATED	
COPPER (UG/L)		DET'N LIMIT = .100	GUIDELINE = 1000 (A3)
JUN	34.000	.720 <T	
NOV	39.000	.930 <T	
IRON (UG/L)		DET'N LIMIT = 4.000	GUIDELINE = 300. (A3)
JUN	300.000	8.800 <T	
NOV	250.000	BDL	
MANGANESE (UG/L)		DET'N LIMIT = .050	GUIDELINE = 50.0 (A3)
JUN	11.000	3.600	
NOV	12.000	2.200	
MOLYBDENUM (UG/L)		DET'N LIMIT = 0.020	GUIDELINE = 500 (H)
JUN	.620	.800	
NOV	.620	.700	
NICKEL (UG/L)		DET'N LIMIT = 0.100	GUIDELINE = 50. (F3)
JUN	1.100 <T	.400 <T	
NOV	.650 <T	.120 <T	
LEAD (UG/L)		DET'N LIMIT = 0.050	GUIDELINE = 50. (A1)
JUN	1.200	.080 <T	
NOV	1.600	.160 <T	
ANTIMONY (UG/L)		DET'N LIMIT = .050	GUIDELINE = 146. (D4)
JUN	.170 <T	.190 <T	
NOV	.350	.420	
SELENIUM (UG/L)		DET'N LIMIT = 0.200	GUIDELINE = 10. (A1)
JUN	.620 <T	1.100 <T	
NOV	1.400 <T	1.000 <T	
STRONTIUM (UG/L)		DET'N LIMIT = .050	GUIDELINE = 2000.(H)
JUN	120.000	130.000	
NOV	110.000	120.000	
TITANIUM (UG/L)		DET'N LIMIT = .050	GUIDELINE = N/A

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM HARROW-COLCHESTER SOUTH WSS 1988

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM
	RAW	TREATED	
THALLIUM (UG/L)		DET'N LIMIT = .010	GUIDELINE = 13. (D4)
JUN	BDL	BDL	
NOV	.310	.060 <T	
URANIUM (UG/L)		DET'N LIMIT = .020	GUIDELINE = 20. (A2)
JUN	.260	.090 <T	
NOV	.250	.070 <T	
VANADIUM (UG/L)		DET'N LIMIT = .050	GUIDELINE = 100 (N)
JUN	.720	.570	
NOV	.720	.650	
ZINC (UG/L)		DET'N LIMIT = .001	GUIDELINE = 5000. (A3)
JUN	15.000	1.800	
NOV	4.700	1.100	

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM NARROW-COLCHESTER SOUTH WSS 1988

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM
	RAW	TREATED	
PESTICIDES & PCB			
ALPHA BHC (NG/L)		DET'N LIMIT = 1.000	GUIDELINE = 700 (G)
JUN	BDL	BDL	
NOV	2.000 <T	BDL	

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM HARROW-COLCHESTER SOUTH WDS 1988

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM
	RAW	TREATED	
PHENOLICS (UG/L)		DET'N LIMIT = 0.2	GUIDELINE = 2.00 (A3)
JUN	1.200	.400 <T	
NOV	1.200	.600 <T	

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM HARROW-COLCHESTER SOUTH WSS 1988

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM
	RAW	TREATED	
VOLATILES			
CHLOROFORM (UG/L)		DET'N LIMIT = .100	GUIDELINE = 350 (A1+)
JUN	BDL	9.100	
NOV	BDL	9.500	
DICHLOROBROMOMETHANE (UG/L)		DET'N LIMIT = .050	GUIDELINE = 350 (A1+)
JUN	BDL	7.500	
NOV	BDL	8.000	
CHLORODIBROMOMETHANE (UG/L)		DET'N LIMIT = .100	GUIDELINE = 350 (A1+)
JUN	BDL	5.100	
NOV	BDL	5.700	
BROMOFORM (UG/L)		DET'N LIMIT = .200	GUIDELINE = 350 (A1+)
JUN	BDL	.400 <T	
NOV	BDL	.600 <T	
TOTL TRIHALOMETHANES (UG/L)		DET'N LIMIT = .500	GUIDELINE = 350 (A1)
JUN	BDL	22.100	
NOV	BDL	23.800	

Table 6

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
BACTERIOLOGICAL			
STANDARD PLATE COUNT MEMBRANE	CT/ML	0	500/ML(A1)
FILTRATION P/A BOTTLE		0	0 (A1*)
TOTAL COLIFORM MEMBRANE FILTRATION	CT/100ML	0	5/100mL(A1)
TOTAL COLIFORM BACKGROUND MF	CT/100ML	0	N/A
CHLOROAROMATICS			
HEXACHLOROBUTADIENE	NG/L	1.000	450. (D4)
1,2,3-TRICHLOROBENZENE	NG/L	5.000	10000 (I)
1,2,3,4-TETRACHLOROBENZENE	NG/L	1.000	10000 (I)
1,2,3,5-TETRACHLOROBENZENE	NG/L	1.000	10000 (I)
1,2,4-TRICHLOROBENZENE	NG/L	5.000	10000 (I)
1,2,4,5-TETRACHLOROBENZENE	NG/L	1.000	38000 (D4)
1,3,5-TRICHLOROBENZENE	NG/L	5.000	10000 (D4)
HEXACHLOROBENZENE	NG/L	1.0	10. (C1)
HEXACHLOROETHANE	NG/L	1.000	1900. (D4)
OCTACHLOROSTYRENE	NG/L	1.000	N/A
PENTACHLOROBENZENE	NG/L	1.000	74000 (D4)
2,3,6-TRICHLOROTOLUENE	NG/L	5.000	N/A
2,4,5-TRICHLOROTOLUENE	NG/L	5.000	N/A
2,6,A-TRICHLOROTOLUENE	NG/L	5.000	N/A
CHLOROPHENOLS			
2,3,4-TRICHLOROPHENOL	NG/L	50.	N/A
2,3,4,5-TETRACHLOROPHENOL	NG/L	50.	N/A
2,3,5,6-TETRACHLOROPHENOL	NG/L	50.	N/A
2,4,5-TRICHLOROPHENOL	NG/L	50.	2600000 (D4)
2,4,6-TRICHLOROPHENOL	NG/L	50.	5000. (B1)
PENTACHLOROPHENOL	NG/L	50.	60000. (B1)
CHEMISTRY (FLD)			
FIELD COMBINED CHLORINE RESIDUAL	MG/L	N/A	N/A
FIELD FREE CHLORINE RESIDUAL	MG/L	N/A	N/A
FIELD TOTAL CHLORINE RESIDUAL	MG/L	N/A	N/A
FIELD PH	DMSNLESS	N/A	6.5-8.5(A4)
FIELD TEMPERATURE	^{o}C	N/A	<15 ^{o}C(A1)
FIELD TURBIDITY	FTU	N/A	1.0 (A1)
CHEMISTRY (LAB)			
ALKALINITY	MG/L	.200	30-500(A4)
CALCIUM	MG/L	.100	100. (F2)
CYANIDE	MG/L	.001	.20(A1)
CHLORIDE	MG/L	.200	250. (A3)
COLOUR	TCU	.5	5.0 (A3)
CONDUCTIVITY	UMHO/CM	1.	400. (F2)
FLUORIDE	MG/L	.01	2.4 (A1)
HARDNESS	MG/L	.50	80-100(A4)
MAGNESIUM	MG/L	.05	30. (F2)

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
NITRITE	MG/L	.001	1.0 (A1)
TOTAL NITRATES	MG/L	.02	10. (A1)
NITROGEN TOTAL KJELDAHL	MG/L	.02	N/A
PH	DMSNLESS	N/A	6.5-8.5(A4)
PHOSPHORUS FIL REACT	MG/L	.0005	N/A
PHOSPHORUS TOTAL	MG/L	.002	.40(F2)
TOTAL SOLIDS	MG/L	1.	500. (A3)
TURBIDITY	FTU	.02	1.0 (A1)
METALS			
ALUMINUM	UG/L	.050	100. (A4)
ANTIMONY	UG/L	.050	146. (D4)
ARSENIC	UG/L	.050	50. (A1)
BARIUM	UG/L	.020	1000. (A1)
BORON	UG/L	.200	5000. (A1)
BERYLLIUM	UG/L	.010	0.20 (H)
CADMIUM	UG/L	.050	5.0 (A1)
COBALT	UG/L	.020	1000. (H)
CHROMIUM	UG/L	.100	50. (A1)
COPPER	UG/L	.100	1000. (A3)
IRON	UG/L	5.0	300. (A3)
MERCURY	UG/L	.01	1.0 (A1)
MANGANESE	UG/L	.050	50. (A3)
MOLYBDENUM	UG/L	.020	500. (H)
NICKEL	UG/L	.100	50. (F3)
LEAD	UG/L	.020	50. (A1)
SELENIUM	UG/L	.200	10. (A1)
SILVER	UG/L	.020	50. (A1)
STRONTIUM	UG/L	.100	2000. (H)
THALLIUM	UG/L	.010	13. (D4)
TITANIUM	UG/L	.100	N/A
URANIUM	UG/L	.020	20. (A2)
VANADIUM	UG/L	.020	100. (H)
ZINC	UG/L	.020	5000. (A3)
PHENOLICS			
PHENOLICS (UNFILTERED REACTIVE)	UG/L	.2	2.0 (A3)
PESTICIDES & PCB			
ALDRIN	NG/L	1.0	700. (A1)
AMETRINE	NG/L	50.	300000. (D3)
ATRAZINE	NG/L	50.	60000. (B3)
ALPHA HEXACHLOROCYCLOHEXANE (BHC)	NG/L	1.0	700. (G)
BETA HEXACHLOROCYCLOHEXANE (BHC)	NG/L	1.0	300. (G)
GAMMA HEXACHLOROCYCLOHEXANE(LINDANE)	NG/L	1.0	4000. (A1)
ALPHA CHLORDANE	NG/L	2.0	7000. (A1)
GAMMA CHLORDANE	NG/L	2.0	7000. (A1)
BLADEX	NG/L	100.	10000. (B3)
DIELDRIN	NG/L	2.0	700. (A1)
METHOXYCHLOR	NG/L	5.0	100000. (A1)
ENDOSULFAN 1 (THIODAN I)	NG/L	2.0	74000. (D4)
ENDOSULFAN 2 (THIODAN II)	NG/L	4.0	74000. (D4)
ENDRIN	NG/L	4.0	200. (A1)
ENDOSULFAN SULPHATE(THIODAN SULPHATE)	NG/L	4.0	N/A
HEPTACHLOR EPOXIDE	NG/L	1.0	3000. (A1)

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE	
HEPTACHLOR	NG/L	1.0	3000.	(A1)
METOLACHLOR	NG/L	500.	50000.	(B3)
MIREX	NG/L	5.0	N/A	
OXYCHLORDANE	NG/L	2.0	N/A	
O,P-DDT	NG/L	5.0	30000.	(A1)
PCB	NG/L	20.0	3000.	(A2)
O,P-DDD	NG/L	5.0	N/A	
PPDDE	NG/L	1.0	30000.	(A1)
PPDDT	NG/L	5.0	30000.	(A1)
ATRATONE	NG/L	50.	N/A	
ALACHLOR	NG/L	500.	35000.	(D2)
PROMETONE	NG/L	50.	52500.	(D3)
PROPAZINE	NG/L	50.	16000.	(D2)
PROMETRYNE	NG/L	50.	1000.	(B3)
SENCOR (METRIBUZIN)	NG/L	100.	80000.	(B2)
SIMAZINE	NG/L	50.	10000.	(B3)
POLYAROMATIC HYDROCARBONS				
PHENANTHRENE	NG/L	10.0	N/A	
ANTHRACENE	NG/L	1.0	N/A	
FLUORANTHENE	NG/L	20.0	42000.	(D4)
PYRENE	NG/L	20.0	N/A	
BENZO(A)ANTHRACENE	NG/L	20.0	N/A	
CHRYSENE	NG/L	50.0	N/A	
DIMETHYL BENZO(A)ANTHRACENE	NG/L	5.0	N/A	
BENZO(E)PYRENE	NG/L	50.0	N/A	
BENZO(B)FLUORANTHENE	NG/L	10.0	N/A	
PERYLENE	NG/L	10.0	N/A	
BENZO(K)FLUORANTHENE	NG/L	1.0	N/A	
BENZO(A)PYRENE	NG/L	5.0	10.	(B1)
BENZO(G,H,I)PERYLENE	NG/L	20.0	N/A	
DIBENZO(A,H)ANTHRACENE	NG/L	10.0	N/A	
INDENO(1,2,3-C,D)PYRENE	NG/L	20.0	N/A	
BENZO(B)CHRYSENE	NG/L	2.0	N/A	
CORONENE	NG/L	10.0	N/A	
SPECIFIC PESTICIDES				
TOXAPHENE	NG/L	N/A	5000.	(A1)
2,4,5-TRICHLOROBUTYRIC ACID (2,4,5-T)	NG/L	50.	280000.	(B1)
2,4-DICHLOROBUTYRIC ACID (2,4-D)	NG/L	100.	100000.	(A1)
2,4-DICHLORORPHENOXYBUTYRIC ACID	NG/L	200.	18000.	(B3)
2,4-D PROPIONIC ACID	NG/L	100.	N/A	
DICAMBA	NG/L	100.	87000.	(B3)
PICHLORAM	NG/L	100.	2450000.	(D3)
SILVEX (2,4,5-TP)	NG/L	50.	10000.	(A1)
DIAZINON	NG/L	20.	14000.	(A1)
DICHLOROVOS	NG/L	20.	N/A	
DURSBAN	NG/L	20.	N/A	
ETHION	NG/L	20.	35000.	(G)
GUTHION	NG/L	N/A	N/A	
MALATHION	NG/L	20.	160000.	(G)
MEVINPHOS	NG/L	20.	N/A	
METHYL PARATHION	NG/L	50.	7000.	(B3)
METHYLTRITHION	NG/L	20.	N/A	
PARATHION	NG/L	20.	35000.	(B1)

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
PHORATE (THIMET)	NG/L	20.	35. (D2)
RELDAN	NG/L	20.	N/A
RONNEL	NG/L	20.	N/A
AMINOCARB	NG/L	N/A	N/A
BENONYL	NG/L	N/A	N/A
BUX (METALKAMATE)	NG/L	2000.	N/A
CARBOFURAN	NG/L	2000.	18000. (D3)
CICP (CHLORPROPHAM)	NG/L	2000.	350000. (G)
DIALLATE	NG/L	2000.	30000. (H)
EPTAM	NG/L	2000.	N/A
IPC	NG/L	2000.	N/A
PROPOXUR (BAYGON)	NG/L	2000.	90000. (G)
SEVIN (CARBARYL)	NG/L	200.	70000. (A1)
SUTAN (BUTYLATE)	NG/L	2000.	245000. (D3)
VOLATILES			
BENZENE	UG/L	.050	5.0 (B1)
TOLUENE	UG/L	.050	24.0 (B4)
ETHYLBENZENE	UG/L	.050	2.4 (B4)
PARA-XYLENE	UG/L	.100	300. (B4)
META-XYLENE	UG/L	.100	300. (B4)
ORTHO-XYLENE	UG/L	.050	300. (B4)
1,1-DICHLOROETHYLENE	UG/L	.100	7.0 (D1)
ETHLYENE DIBROMIDE	UG/L	.05	50. (G)
METHYLENE CHLORIDE	UG/L	.500	1750. (D3)
TRANS-1,2-DICHLOROETHYLENE	UG/L	.100	350. (D3)
1,1-DICHLOROETHANE	UG/L	.100	N/A
CHLOROFORM	UG/L	.100	350. (A1+)
1,1,1-TRICHLOROETHANE	UG/L	.020	200. (D1)
1,2-DICHLOROETHANE	UG/L	.050	5.0 (D1)
CARBON TETRACHLORIDE	UG/L	.200	5.0 (D1)
1,2-DICHLOROPROPANE	UG/L	.050	10.0 (G)
TRICHLOROETHYLENE	UG/L	.100	5.0 (D1)
DICHLOROBROMOMETHANE	UG/L	.050	350. (A1+)
1,1,2-TRICHLOROETHANE	UG/L	.050	.60(D4)
CHLORODIBROMOMETHANE	UG/L	.100	350. (A1+)
TETRACHLOROETHYLENE	UG/L	.050	10.0 (C2)
BROMOFORM	UG/L	.200	350. (A1+)
1,1,2,2-TETRACHLOROETHANE	UG/L	.050	0.17(D4)
CHLOROBENZENE	UG/L	.100	1510. (D3)
1,4-DICHLOROBENZENE	UG/L	.100	5.0 (B1)
1,3-DICHLOROBENZENE	UG/L	.100	130. (G)
1,2-DICHLOROBENZENE	UG/L	.050	200. (B1)
TRIFLUOROCHLOROTOLUENE	UG/L	.100	N/A
TOTAL TRIHALOMETHANES	UG/L	.500	350. (A1)
STYRENE	UG/L	.05	46.5 (D2)